DEPARTMENT OF COMPUTER SCIENCE

CMPT 429.3

TIME: 75 minutes MIDTERM EXAM CLOSED BOOK NOV. 19, 1996

MARKS

1. GIVE PRECISE DEFINITIONS TO THE FOLLOWING:

(10) a) SENTENTIAL FORM
b) LANGUAGE GENERATED BY A GRAMMAR G
c) CONTEXT-SENSITIVE GRAMMAR
d) VALID PREFIX PROPERTY
e) HANDLE

(15) 2. FROM A PROGRAMMING LANGUAGE DESIGN PERSPECTIVE, GIVE A BRIEF EVALUATION OF A PROGRAMMING LANGUAGE WITH WHICH YOU ARE FAMILIAR.

(15) 3. a) WHY ARE SCANNERS USED IN COMPILERS?
b) CONSTRUCT A FINITE-STATE ACCEPTOR THAT ACCEPTS BINARY STRINGS THAT HAVE VALUES DIVISIBLE BY 3. A TRANSITION DIAGRAM WILL DO.

(20) 4. a) SHOW THAT THE GRAMMAR WITH PRODUCTIONS

$$S' \rightarrow S\#$$
$$S \rightarrow aaSbb \mid a \mid \epsilon$$

is LL(2).

b) WHAT LANGUAGE IS GENERATED BY THE GRAMMAR?

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c) FIND AN EQUIVALENT LL(1) GRAMMAR FOR THE LANGUAGE GENERATED BY THE GRAMMAR IN PART(a).

d) CONSTRUCT AN LL(1) PARSING TABLE FOR YOUR GRAMMAR OF PART(c).

(15) 5. OBTAIN A GRAMMAR FOR THE LANGUAGE:

$$L = \{ 0^n 1^n 2^n \mid n > 0 \}$$

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